**Practice Exam Macro 2**

**Group 1**

1. Consider an economy whose GDP per capita grows at 3.5% per year. If this growth is maintained in the future, how many years will it take for its GDP per capita to triple?

**X.1,035t = 3X**

**1,035t = 3X/X**

**1,035t = 3**

**t.ln(1,035)=ln(3)**

**t=ln(3)/ln(1,035)=31,9=32~**

**It will take 32 years..**

1. Consider an economy that behaves according to the assumptions of the Harrod-Domar model. We also know that the productivity of physical capital equals 0.25; the depreciation rate is 2%/year; and the investment rate is 20%. If the level of output in this economy in 2022 equalled 100 billion monetary units, estimate its output will be in 2030.

**gw = s/v-d ; v=1/0,25=4**

**gw=0,2/4-0,02=0,03**

**Y(2030)=Y(2022)\*(1,03)8= 100\*(1,03)8=126,7~**

**In 20230, the output of this economy will be equivalent to approximately 127 billion m.u,**

**Group 2**

1. Consider an economy described by the following Cobb-Douglas production function:

Yt = At.Kt0,4.Lt0,6

, where Yt represents output, At represents total factor productivity, Kt represents the physical capital stock, and Lt repreesents the total employed population. Knowing that, in a given year, the physical capital stock grew by 2%, the employed population increased by 1% and the average labor productivity increased by 3%, calculate how much the total factor productivity varied in that year. Discuss your finding and explain what is meant by total factor productivity.

**r(Y)=r(A)+0,4r(K)+0,6r(L)**

**r(Y/L)=r(Y)-r(L) ⬄ 0,03=r(Y)-0,01 ⬄ r(Y)=0,04**

**0,04=r(A)+0,4\*0,02+0,6\*0,01**

**⬄ r(A)=0,04-0,4\*0,02-0,6\*0,01=0,026=2,6%**

**Total factor productivity will have increased by 2.6% in that year.**

**Total factor productivity is understood to be the component of output and its variation that cannot be explained by the variation in the production factors specified in the production function (in this case, the stock of physical capital and the employed population). It is usually calculated as a residual, corresponding to the joint effect of all other relevant variables, which may include technology, institutional framework, etc.**

1. Consider an economy which behaves in accordance with the Solow model and the following Cobb-Douglas production function:

Yt = 0,5\*Kt0,4\*Lt0,6

where Y represents output, K represents the physical capital stock, and L represents the employed population. The Statistics Institute tells us that, in 2022, consumption per worker in the economy as a whole equalled 0.56 monetary units and investment per worker equalled 0.14 m.u. It is also known that the depreciation rate is 4% per year and the employed population growth rate is 1% per year.

Check whether in 2022 the economy was in its steady state.

**y=0,5.k0,4**

**y0=0,56+0,14=0,7**

**0,7=0,5.k00,4**

**k00,4=0,7/0,5=1,4**

**k0=1,41/0,4=2,319~**

**Steady state requires s.y=(n+δ).k**

**Was it the case with k0?**

**0,14=(0,04+0,01).2,319 ?**

**0,14 0,116**

**The economy was not in steady state.**

**Group 3**

1. Define industrial policy, distinguish between horizontal and vertical industrial policies and provide examples of each of the latter.

**Industrial policy is the whole set of public policies that aim to influence the productive structure and the pattern of specialization of an economy, namely in the sense of its qualification and structural transformation.**

**So-called “horizontal” industrial policies are those that affect the economy as a whole or very broadly defined sectors – for example, tax benefits for all and any expenditure on research and development.**

**So-called “vertical” industrial policies are those that imply a greater degree of selectivity, being directed towards narrowly defined sectors or even towards specific companies that the State considers it advantageous to support – for example, the creation of entry barriers in order to create markets with temporary monopolistic or oligopolistic conditions in order to allow the benefited companies to acquire scale and know-how.**

1. Briefly explain the meaning of the expression r>g within the theoretical framework of the French economist Thomas Piketty, as well as its implication for inequality.

**In the theoretical framework of Thomas Piketty, a French economist who has dedicated himself to the study of inequalities and their empirical evolution, r>g means that there is a generalized tendency for the return on capital (r) to be higher than the economy's growth rate ( g), with the implication that the relative size of the accumulated mass of capital (which in Piketty is understood basically as wealth or heritage), tending to be held by a small portion of the population, tends to grow faster than the economy as a whole. This mechanism implies a tendency towards a continuous increase in inequality, which in Piketty's empirical analysis was only interrupted during part of the twentieth century, mainly due to highly progressive taxation, other measures of financial repression and the destruction of capital caused by the two world wars. worldwide.**

**Group 4**

1. Briefly explain what is meant by financialization and indicate some of the main harmful consequences of this phenomenon as pointed out by its critics.

**A “financeirização” pode ser definida como o aumento da importância e do poder dos agentes financeiros, dos mercados financeiros e das lógicas financeiras no conjunto da economia. Implica tipicamente um aumento relativo do peso dos rendimentos financeiros no conjunto dos rendimentos de capital, do peso dos rendimentos do capital face aos rendimentos do trabalho e dos rendimentos salariais de topo (gestores de topo) face aos rendimentos salariais dos restantes trabalhadores. Para os seus críticos, a financeirização, tanto enquanto processo como enquanto fase do capitalismo característica das últimas décadas, tem com principais aspetos nocivos o facto de estar associado a baixo investimento produtivo e relativa estagnação do crescimento; aumento das desigualdades socioeconómicas; e aumento da instabilidade financeira, com maior frequência e intensidade de crises financeiras.**

1. Consider a pay-as-you-go social security system that is financially balanced. Assume that average labor productivity grows by 2% per year, without any change in the functional income distribution; that the social security contribution rate does not change; and that the ratio between the number of pensioners and the number of workers increases by 1.5% per year. Under these conditions, find the maximum increase in the average pension that is compatible with maintaining the financial balance of the system. Show all the calculations required to reach this conclusion.

**r(w)+r(b)+r(L)=r(P)+r(Nr)**

**If the functional distribution of income does not change, then r(w)=r(Y/L)=0,02**

**0,02+0=r(P)+r(Nr)-r(L)**

**0,02=r(P)+r(Nr/L)**

**0,02=r(P)+0,015**

**r(P)=0,005**

**At most, the average pension can increase 0,5% per year.**